W02959-QES

Quanterra
Environmental Services

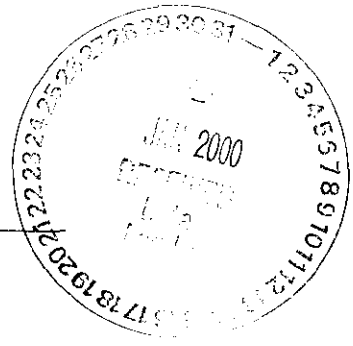
Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CASE NARRATIVE

0052702

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352



January 24, 2000

Attention: Joan Kessner

Project Number	:	33617
SDG	:	W02959
Number of Samples	:	one (1)
Sample Matrix	:	Soil
Data Deliverable	:	Summary
Date SDG Closed	:	December 3, 1999

II. Introduction

On December 3, 1999, nine (9) "solid" samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. The samples were received at St. Louis on 12/06/99 at a temperature of 13 degrees C. See the attached Sample Summary sheet for the client and lab Ids for these samples.

III. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Analyses requested: ICP Metals - 6010A (Supertrace+ add ons)
Hexavalent Chromium - 7196

Deviation from Request: There were no deviations.

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike
MS- Matrix Spike.
MSD- Matrix Spike Duplicate.

V. Comments

General: The term "Detection Limit" used in the analytical data reports refers to either the lab's standard reporting limits or contractually required reporting limits, whichever is applicable.

Please refer to the attached cross-reference table for the standard preparation methods used at Quanterra, St. Louis.

Metals: A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Spike Duplicate were analyzed with each preparation batch per the protocol for this analysis.

Several compounds have matrix spike/matrix spike duplicate recoveries outside QC limits. The LCS recoveries for all compounds are within control limits.

Hex. Cr: A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Spike Duplicate were analyzed with each preparation batch per the protocol for this analysis.

The recovery of the LCS and MSD associated with the Hexavalent Chromium data is slightly above the control limit of 120%, at 125% and 123% respectively. The data was reported with a non-conformance memo (# 6093) because the sample result was a non-detect.

I certify that this Data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Marti Ward

Marti Ward
St. Louis Project Manager

LOG #: 6093

LABORATORY NONCONFORMANCE MEMO (NCM)

Quanterra Incorporated

Project ID/Client: 550.2607 / HANFORD

NCM Initiated by/Date: T. Weiss / 12-17-99 Project Manager: M. Ward

Sample Numbers/QC batch or lot numbers: 22502-001, 22514-001, 22518-001, F9L070147

Tests: CR6 / 7196 / Q4

Analytical Area (check appropriate area):

☐ Sample control	☐ GC	☒ Wet chemistry	☐ Data review
☐ Organic preparation	☐ HPLC	☐ Metals	☐ Radiochemistry
☐ Inorganic preparation	☐ GC/MS	☐ Reporting	☐ _____

Nonconformance (check appropriate area): *To be completed by analyst*

Holding Time Violations (exceeded by _____ days)

Category I: Laboratory Independent

- ☐ 1. Holding time expired in transit
- ☐ 2. Sample rec'd > 48 hrs after sampling. or ½ holding time has expired
- ☐ 3. Test added by client after expiration

Category II: Laboratory Dependent

- ☐ 4. Instrument failure
- ☐ 5. Analyst error
- ☐ 6. Log-in error
- ☐ 7. Miscommunication
- ☐ 8. Other (explanation required) _____

Category III: Analysis Reruns (QA/QC)

- ☐ 9. Surrogates
- ☐ 10. Internal standards
- ☐ 11. Spike recoveries
- ☐ 12. Blank contamination

Category IV: Analysis Reruns (Confirmation)

- ☐ 13. Second column
- ☐ 14. Contamination check
- ☐ 15. Confirmation of matrix effects
- ☐ 16. Other (explanation required) _____

Category V: Analysis Reruns (Dilution)

- ☐ 17. Over calibration
- ☐ 18. Under calibration
- ☐ 19. Other (explanation required) _____

Quality Assurance/Quality Control

- ☒ 20. QC data reported outside of controls
- ☐ 21. Incorrect procedure used
- ☐ 22. SOP intentionally modified with QA and tech approval
- ☐ 23. Invalid instrument calibration
- ☐ 24. Received insufficient sample for proper analysis

Incorrect or Incomplete Client Deliverable

- ☐ 25. Hardcopy deliverable error
- ☐ 26. Electronic deliverable error

Reported Detection Limits Elevated Due to:

- ☐ 27. Sample matrix: Does not include high analyte content
- ☐ 28. Insufficient sample volume
- ☐ 29. Other (explanation required)

Miscellaneous

- ☐ 30. Instrument/equipment Tag-out
- ☐ 31. Other (explanation required)

Notification (check appropriate area): ☒ **Required** ☐ **Not Required** *To be completed by project manager*

Client notified by (name and date): Mulard 12/30/99

- ☒ In writing narrative
- ☐ By facsimile
- ☐ By telephone
- ☐ Other (explain)

Client's name and response: _____

- ☐ Process "as is"
- ☐ Re-sample
- ☐ On hold until _____
- ☐ Other (explain)

Project manager (signature and date): Mulard 12/30/99

000005

QUANTERRA LABORATORY NONCONFORMANCE MEMO LOG #: 6093

Corrective Action: *To be completed and reviewed by all associates involved*

Problem Description/Root Cause Author's initials and date: TLK 12-17-99

CCVs at 120% Fall outside QC limits of +/- 15%

LCS at 125% Fall outside QC limits of +/- 20%

Corrective Actions (Short Term) Author's initials and date: TLK 12-17-99

Talked to Supervisor and decided to report data on the basis that sample concentrations are non-detect. and based on QC data, data biased high.

Corrective Actions to Prevent Reoccurrence (Long Term)

Watch instrument for possible drifting from baseline. ~~TLK 12-17-99~~ TLK 12-17-99

Corrective Action approved by (Supervisor/Group Leader) and date: [signature] 12/20/99

Additional Comments:

Corrective Action to be completed by (if other than Supervisor/Group Leader):

Date Corrective Action is to be completed:

Quality Assurance Review *To be completed by a QA associate*

☐ Anomaly ☒ Deficiency ☐ Notified Ops/Sys Manager (Initials)

☐ Further action required:

Further action assigned to:

QA signature: [signature] Date: 12-30-99

Corrective Action Verification: *To be completed by a QA associate*

☐ Verification not required or requested

☐ Verified / CA completed on: by

☐ Cannot verify (specify reason)

Verified by: Date:

Nonconformance Memo Closure:

QA signature: Date:

The Office of Quality Assurance maintains a copy of this NCM indicating its final status.

000006

SAMPLE SUMMARY

F9L070147

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
D5WCG	001	B0WN26	12/02/99	10:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

METHODS SUMMARY

F9L070147

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Hexavalent Chromium	SW846 7196A	SW846 7196
Mercury in Solid Waste (Manual Cold-Vapor)	SW846 7471A	SW846 7471A
Percent Moisture	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B	SW846 3050B

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

QUANTERRA INCORPORATED
CLIENT ANALYSIS SUMMARY
Quanterra - St. Louis

Run Date: 12/07/99
Time: 16:29:26
User Id.: SMITHJE

CLIENT: 127642 BECHTEL HANFORD, INC.
PROJECT MANAGER: MARTI WARD
PROJECT #: GROUNDWATER
REPORT TO: Bechtel Hanford, Inc.
P.O. NUMBER: MRC-SBB-A-19981
SITE: B99-078
AMOUNT REC"D: 250G
STORAGE LOC: R16A
LOT COMMENTS:
MATRIX: SOLID
SAMPLE ID: B0WN26
QC PACKAGE: Special Report - see checklist
SAMPLE COMMENTS:

QUOTE/SAR #: 33617
LAB ID: F-9L070147-001
WORK ORDER: D5WCG
RECEIVING DATE: 12/03/99
SAMPLING DATE: 12/02/99
ANALYTICAL DUE DATE: 12/31/99N
REPORT DUE DATE: 1/14/00
PRIORITY: 28
SAMPLING TIME: 10:00
RECEIVING TIME: 12:05
SDG# : W02959

Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Moisture, Percent (160.3)	06	12/07/99	0/00/00	3/10/00
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(A-88-WM-01) D5WCG-1-01 Protocol: A QC Program: STANDARD TEST SET				
Inductively Coupled Plasma (6010B Trace)	06	12/07/99	0/00/00	5/30/00
METALS, TOTAL - Soils				
MT6010_S AG,AS,BA,BE,CD,CR,CU,NI,PB,SB,SE,TL,VX,ZN				
(A-46-QM-01) D5WCG Protocol: A QC Program: STANDARD TEST SET				
Mercury (7471A, Cold Vapor) - Solids	06	12/07/99	0/00/00	12/30/99
METALS, TOTAL (Method Exclusive) - Solids				
M7471_S HG				
(A-70-09-01) D5WCG Protocol: A QC Program: STANDARD TEST SET				
Chromium, Hexavalent (7196A)	06	12/07/99	3/10/00	12/06/99
LEACHATE, DI (Routine)				
(A-82-EA-01) D5WCG-1-1J Protocol: A QC Program: STANDARD TEST SET				

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 33617
PROJECT MANAGER: MARTI WARD LAB ID: F-9L070147-001-D
PROJECT #: GROUNDWATER WORK ORDER: D5WCG MSD
REPORT TO: Bechtel Hanford, Inc. RECEIVING DATE: 12/03/99
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 12/02/99
SITE: B99-078 ANALYTICAL DUE DATE: 12/31/99N
AMOUNT REC"D: 250G REPORT DUE DATE: 1/14/00
STORAGE LOC: R16A PRIORITY: 28
LOT COMMENTS: SAMPLING TIME: 10:00
MATRIX: SOLID RECEIVING TIME: 12:05
SAMPLE ID: B0WN26
QC PACKAGE: Special Report - see checklist SDG# : W02959
SAMPLE COMMENTS:

Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Inductively Coupled Plasma (6010B Trace)	06	12/07/99	0/00/00	5/30/00
METALS, TOTAL - Soils				
MT6010_S AG,AS,BA,BE,CD,CR,CU,NI,PB,SB,SE,TL,VX,ZN				
(A-46-QM-01) D5WCG Protocol: A QC Program: STANDARD TEST SET				
Mercury (7471A, Cold Vapor) - Solids	06	12/07/99	0/00/00	12/30/99
METALS, TOTAL (Method Exclusive) - Solids				
M7471_S HG				
(A-70-09-01) D5WCG Protocol: A QC Program: STANDARD TEST SET				
Chromium, Hexavalent (7196A)	06	12/07/99	3/10/00	12/06/99
LEACHATE, DI (Routine)				
(A-82-EA-01) D5WCG-1-1L Protocol: A QC Program: STANDARD TEST SET				

QUANTERRA INCORPORATED
CLIENT ANALYSIS SUMMARY
Quanterra - St. Louis

Run Date: 12/07/99
Time: 16:29:26
User Id.: SMITHJE

CLIENT: 127642 BECHTEL HANFORD, INC.
PROJECT MANAGER: MARTI WARD
PROJECT #: GROUNDWATER
REPORT TO: Bechtel Hanford, Inc.
P.O. NUMBER: MRC-SBB-A-19981
SITE: B99-078
AMOUNT REC"D: 250G
STORAGE LOC: R16A
LOT COMMENTS:
MATRIX: SOLID
SAMPLE ID: B0WN26
QC PACKAGE: Special Report - see checklist
SAMPLE COMMENTS:

QUOTE/SAR #: 33617
LAB ID: F-9L070147-001-S
WORK ORDER: D5WCG MS
RECEIVING DATE: 12/03/99
SAMPLING DATE: 12/02/99
ANALYTICAL DUE DATE: 12/31/99N
REPORT DUE DATE: 1/14/00
PRIORITY: 28
SAMPLING TIME: 10:00
RECEIVING TIME: 12:05
SDG# : W02959

Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Inductively Coupled Plasma (6010B Trace)	06	12/07/99	0/00/00	5/30/00
METALS, TOTAL - Soils				
MT6010_S AG,AS,BA,BE,CD,CR,CU,NI,PB,SB,SE,TL,VX,ZN				
(A-46-QM-01) D5WCG Protocol: A QC Program: STANDARD TEST SET				
Mercury (7471A, Cold Vapor) - Solids	06	12/07/99	0/00/00	12/30/99
METALS, TOTAL (Method Exclusive) - Solids				
M7471_S HG				
(A-70-09-01) D5WCG Protocol: A QC Program: STANDARD TEST SET				
Chromium, Hexavalent (7196A)	06	12/07/99	3/10/00	12/06/99
LEACHATE, DI (Routine)				
(A-82-EA-01) D5WCG-1-1K Protocol: A QC Program: STANDARD TEST SET				

CUR 020337 128C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-150	Page 1 of 1

Collector: Bowers/Trice / Cearlock

Company Contact: Chris Cearlock — Telephone No. 372-9574

Project Coordinator: TRENT, SJ

Price Code: 8N

Data Turnaround: 45 Days

Project Designation: 200 Area Source characterization - 200-CW-1 OU

Sampling Location: ~~200-B pond~~ B8757

SAF No.: B99-078

Air Quality ☐

Ice Chest No.:

Field Logbook No.: EL-1511-1

COA: B20CW1671C

Method of Shipment: ~~Fed Ex~~ Airborne 4012558 712

Shipped To: ~~TMA/RECRA~~ ~~Quanterra ST Lois~~ Richland — BZ 12-1-99 RAT 12-3-99 per Steve Trent

Offsite Property No.:

Bill of Lading/Air Bill No.: VRS 12-6-99

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None
Type of Container	aG	aG
No. of Container(s)	1	1
Volume	250mL	250mL
SAMPLE ANALYSIS	See item (1) in Special Instructions. 100% full	See item (2) in Special Instructions.

SDG W02959

Sample No.	Matrix *	Sample Date	Sample Time				
BOWN26	Soil	12/2/99	1000	X	X	~~BOWN27~~ BOWN27

CHAIN OF POSSESSION	Date/Time	Received By	Date/Time
Relinquished By Chris Cearlock	12-2-99/1155	Doug Bowers	12-2-99/1155
Relinquished By Doug Bowers	12-2-99/1530	B.f. IA	12-2-99/1530
Relinquished By B.f. IA	12-3-99/0700	R. Thoren	12-3-99/0700
Relinquished By R. Thoren	12-3-99/1140	R. Nielson	12/3/99 1140
Relinquished By R. Nielson	12/3/99 1204	[illegible]	12-3-99/1205
Relinquished By [illegible]	12-3-99/1600	J. Smith	12-6-99 1020

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A *(Supertrace Add-On)* {Antimony, Beryllium, Copper, Nickel, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

Matrix *: S=Soil, SE=Sediment, SO=Solid, S=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

0001
3

BHI-EE-011 (10/99)

ERC Radiological Counting Facility Analysis Report

RCF Number RCF6864

Sample Date & Time 12/2/99 1000

Project ID: 200-CW-1 SAF Number: B99-078 Date Analyzed 12/2/99 2:57:4

Sample ID: B0WN27

RAT 12-3-99
B0WN24
~~B0WN22~~

RAT 12-3-99
~~B0X488~~

B0WN26

Gamma Energy Analysis

Nuclide		Activity (pCi/g)	Error (pCi/g)	MDC (pCi/g)
K-40	<	9.9E+01		9.9E+01
Co-60	<	1.3E+01		1.3E+01
Cs-137	<	1.2E+01		1.2E+01
Eu-152	<	2.8E+01		2.8E+01
Eu-154	<	3.2E+01		3.2E+01
Eu-155	<	5.3E+01		5.3E+01
Th-232D	<	3.2E+01		3.2E+01
Th-234	<	2.4E+02		2.4E+02
U-235	<	1.0E+02		1.0E+02
U-238	<	1.2E+03		1.2E+03
U-238D	<	2.0E+01		2.0E+01
Am-241	<	3.1E+01		3.1E+01

Total GEA (pCi/g) +/-

	Activity (pCi/g)		Error (pCi/g)
Gross Alpha**	2.8E+00	+/-	7.4E-01
Gross Beta	4.4E+01	+/-	2.3E+00

Alpha MDC (pCi/g)
1.2E+00
Beta MDC (pCi/g)
2.4E+01

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDC = Less than detection limit.
All GEA results reported as "<" list the Minimum Detectable Concentration (MDC) value for that radionuclide.
Rounding error may result in the reported total GEA activity differing from the sum of the > MDC GEA values in the second significant digit.

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.
The analysis of Np-237 is based on the activity of Pa-233.
U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.
Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.
Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass absorption.
No peaks for this radionuclide were visible above background in the spectrum. The result was reported as less than MDC.

Analyst T. J. Smith 12/3/99

Report To: Dave St. John, C CEARLOCK
Fax: 372-9487

Report Printed: Friday, December 03, 1999

COPY

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 12-3 1205 SG#: W02959

Work Order Number: _____ SAF #: B99-005 B00-012 B99-078

Shipping Container ID: SmL 341 Chain of Custody # B99-005-67 +68

1. Custody Seals on shipping container intact? B00-012-01 B99-078-15D Yes [ ] No [✓]
2. Custody Seals dated and signed? Yes [ ] No [✓]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 3°
5. Vermiculite/packing materials is Wet [ ] Dry [✓] n/a
6. Number of samples in shipping container: 15
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - ✓ tape
   - ✓ custody seals
   - _____ hazard labels
   - _____ appropriate sample labels

9. Samples are:
   - ✓ in good condition
   - _____ broken
   - _____ leaking
   - _____ have air bubbles

10. Where any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: [signature] Date: 12-3-99

Telephoned To: _____ On _____ By _____

020337

Quanterra
Environmental Services

Login No.: 9L070147
W02959

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: Richland - Bechtel Hanford
Date: 12-6-99 Time: 1020
Project No: 33617 (550.267)
Initiated by: J. Smith
Shipper/No: Airborne 4012555812
RFA/COC Numbers: B99-078-150

Condition/Variance (Check all that apply):

1. ☐ Sample received broken/leaking.
2. ☐ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C
     Record temperature: _____
   - ☐ pH _____
   - ☐ other: _____
3. ☐ Sample received in improper container.
4. ☐ Sample received without proper paperwork. Explain: _____
5. ☐ Paperwork received without sample.
6. ☐ No sample ID on sample container.
7. ☐ Custody tape disturbed/broken/missing/not tamper evident type (circle all that apply).
8. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
9. ☐ All coolers on airbill not received with shipment.
10. ☐ Other (explain below):

☐ No variances were noted during sample receipt. Cooler Temperature Upon Receipt: 13°C
Temperature Variance Does Not Affect the Following Analyses: blue ice packs NOT frozen
Notes: Shipped 12-3-99; received 12-6-99

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____
☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is".
Comments: _____
☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: (or designate) J. Smith Date: 12-6-99
Project Management Review: M. Ward Date: 12.7.99

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

BECHTEL HANFORD, INC.

Client Sample ID: B0WN26

TOTAL Metals

Lot-Sample #...: F9L070147-001 Matrix.....: SOLID
Date Sampled...: 12/02/99 Date Received..: 12/03/99
% Moisture.....: 12

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 9362441						
Antimony	1.4	1.1	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG102
		Dilution Factor: 1				
Arsenic	2.2	1.1	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG105
		Dilution Factor: 1				
Barium	74.6	22.6	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG108
		Dilution Factor: 1				
Beryllium	0.27 B	0.57	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG10C
		Dilution Factor: 1				
Cadmium	ND	0.23	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG10F
		Dilution Factor: 1				
Chromium	27.0	0.57	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG10J
		Dilution Factor: 1				
Copper	18.0	2.8	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG10M
		Dilution Factor: 1				
Lead	2.5	0.34	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG10Q
		Dilution Factor: 1				
Nickel	17.9	4.5	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG10U
		Dilution Factor: 1				
Selenium	0.93	0.57	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG10X
		Dilution Factor: 1				
Silver	ND	0.57	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG112
		Dilution Factor: 1				
Thallium	ND	1.1	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG115
		Dilution Factor: 1				
Vanadium	51.5	5.7	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG118
		Dilution Factor: 1				
Zinc	38.2	2.3	mg/kg	SW846 6010B	12/28-12/29/99	D5WCG11C
		Dilution Factor: 1				

(Continued on next page)

BECHTEL HANFORD, INC.

Client Sample ID: B0WN26

TOTAL Metals

Lot-Sample #...: F9L070147-001 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 9363254						
Mercury	ND	0.038	mg/kg	SW846 7471A	12/29/99	D5WCG11F
		Dilution Factor: 1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F9L070147 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F9L290000-254 **Prep Batch #...:** 9363254						
Mercury	ND	0.033	mg/kg	SW846 7471A	12/29/99	D6XTG101
		Dilution Factor: 1				
MB Lot-Sample #: F9L280000-441 **Prep Batch #...:** 9362441						
Antimony	ND	1.0	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D139
		Dilution Factor: 1				
Arsenic	ND	1.0	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D13A
		Dilution Factor: 1				
Barium	ND	20.0	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D131
		Dilution Factor: 1				
Beryllium	ND	0.50	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D132
		Dilution Factor: 1				
Cadmium	ND	0.20	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D133
		Dilution Factor: 1				
Chromium	ND	0.50	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D134
		Dilution Factor: 1				
Copper	ND	2.5	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D135
		Dilution Factor: 1				
Lead	ND	0.30	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D136
		Dilution Factor: 1				
Nickel	ND	4.0	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D137
		Dilution Factor: 1				
Selenium	ND	0.50	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D138
		Dilution Factor: 1				
Silver	ND	0.50	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D13E
		Dilution Factor: 1				
Thallium	ND	1.0	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D13F
		Dilution Factor: 1				
Vanadium	ND	5.0	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D13C
		Dilution Factor: 1				

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METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F9L070147 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Zinc	ND	2.0	mg/kg	SW846 6010B	12/28-12/29/99	D6X4D13D

Dilution Factor: 1

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Lot-Sample #...: F9L070147 **Matrix.....:** SOLID

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP-BATCH #
Antimony	119	(18 - 182)			SW846 6010B	12/28-12/29/99	9362441
		(18 - 182)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					
Arsenic	111	(74 - 126)			SW846 6010B	12/28-12/29/99	9362441
		(74 - 126)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					
Barium	102	(77 - 123)			SW846 6010B	12/28-12/29/99	9362441
		(77 - 123)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					
Beryllium	110	(78 - 122)			SW846 6010B	12/28-12/29/99	9362441
		(78 - 122)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					
Cadmium	107	(77 - 123)			SW846 6010B	12/28-12/29/99	9362441
		(77 - 123)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					
Chromium	106	(77 - 123)			SW846 6010B	12/28-12/29/99	9362441
		(77 - 123)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					
Copper	110	(82 - 118)			SW846 6010B	12/28-12/29/99	9362441
		(82 - 118)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					
Lead	96	(76 - 124)			SW846 6010B	12/28-12/29/99	9362441
		(76 - 124)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					
Nickel	93	(78 - 122)			SW846 6010B	12/28-12/29/99	9362441
		(78 - 122)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					
Selenium	108	(74 - 126)			SW846 6010B	12/28-12/29/99	9362441
		(74 - 126)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Lot-Sample #...: F9L070147 **Matrix.....:** SOLID

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP-BATCH #
Silver	111	(75 - 125)			SW846 6010B	12/28-12/29/99	9362441
		(75 - 125)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					
Thallium	109	(51 - 149)			SW846 6010B	12/28-12/29/99	9362441
		(51 - 149)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					
Vanadium	101	(68 - 132)			SW846 6010B	12/28-12/29/99	9362441
		(68 - 132)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					
Zinc	101	(77 - 123)			SW846 6010B	12/28-12/29/99	9362441
		(77 - 123)	200	(0-20)	SW846 6010B	12/28-	9362441
		Dilution Factor: 1					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: F9L070147 **Matrix.....:** SOLID

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: F9L290000-254 **Prep Batch #...:** 9363254					
Mercury	93	(80 - 120)	SW846 7471A	12/29/99	D6XTG102
		Dilution Factor: 1			

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: F9L070147 **Matrix.....:** SOLID
Date Sampled...: 12/02/99 **Date Received..:** 12/03/99

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: F9L070147-001 **Prep Batch #...:** 9362441							
Antimony	63 N	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG103
	61 N	(75 - 125)	2.2	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG104
		Dilution Factor: 1					
Arsenic	104	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG106
	104	(75 - 125)	0.77	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG107
		Dilution Factor: 1					
Barium	107	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG109
	110	(75 - 125)	2.4	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG10A
		Dilution Factor: 1					
Beryllium	109	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG10D
	108	(75 - 125)	0.70	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG10E
		Dilution Factor: 1					
Cadmium	87	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG10G
	86	(75 - 125)	0.25	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG10H
		Dilution Factor: 1					
Chromium	84	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG10K
	160 N,*	(75 - 125)	31	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG10L
		Dilution Factor: 1					
Copper	89	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG10N
	86	(75 - 125)	1.9	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG10P
		Dilution Factor: 1					
Lead	100	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG10R
	100	(75 - 125)	0.46	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG10T
		Dilution Factor: 1					
Nickel	97	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG10V
	113	(75 - 125)	11	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG10W
		Dilution Factor: 1					
Selenium	100	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG110
	99	(75 - 125)	0.41	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG111
		Dilution Factor: 1					
Silver	97	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG113
	96	(75 - 125)	0.87	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG114
		Dilution Factor: 1					

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MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: F9L070147 **Matrix.....:** SOLID
Date Sampled...: 12/02/99 **Date Received..:** 12/03/99

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Thallium	99	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG116
	99	(75 - 125)	0.51	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG117
		Dilution Factor: 1					
Vanadium	99	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG119
	96	(75 - 125)	1.6	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG11A
		Dilution Factor: 1					
Zinc	100	(75 - 125)			SW846 6010B	12/28-12/29/99	D5WCG11D
	107	(75 - 125)	3.8	(0-20)	SW846 6010B	12/28-12/29/99	D5WCG11E
		Dilution Factor: 1					

MS Lot-Sample #: F9L070147-001 **Prep Batch #...:** 9363254

Mercury	101	(75 - 125)			SW846 7471A	12/29/99	D5WCG11G
	100	(75 - 125)	1.3	(0-20)	SW846 7471A	12/29/99	D5WCG11H
		Dilution Factor: 1					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

N Spiked analyte recovery is outside stated control limits.

* Relative percent difference (RPD) is outside stated control limits.

METHOD BLANK REPORT

General Chemistry

Client Lot #...: F9L070147 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hexavalent Chromium		Work Order #: D6JDL101		MB Lot-Sample #:	F9L170000-442	
	ND	0.10	mg/kg	SW846 7196A	12/17/99	9351442
		Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: F9L070147 **Matrix.....:** SOLID

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hexavalent Chromium		Work Order #: D6JDL102	LCS Lot-Sample#: F9L170000-442		
	125	(80 - 120)	SW846 7196A	12/17/99	9351442
		Dilution Factor: 1			

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: F9L070147 **Matrix.....:** SOLID
Date Sampled...: 12/02/99 **Date Received..:** 12/03/99

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hexavalent Chromium		WO#: D5WCG11K-MS/D5WCG11L-MSD				MS Lot-Sample #: F9L070147-001	
	113	(75 - 125)			SW846 7196A	12/17/99	9351442
	127 N	(75 - 125)	12	(0-35)	SW846 7196A	12/17/99	9351442

Dilution Factor: 1

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

N Spiked analyte recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.